

REMARKS

This Amendment is filed in response to the Office Action dated June 7, 2004. All objections and rejections are respectfully traversed.

Claims 40-70 are in the case.

Claims 40-70 have been added to better claim the invention.

Claims 1-39 have been canceled without prejudice.

At paragraph 1 of the Office Action, the drawings were objected to under 37 C.F.R. §1.83(a). The drawings have been amended as noted above, and the drawings are believed to be in acceptable condition.

At paragraph 2 of the Office Action, prior claims were rejected under 35 U.S.C. §102(e) as being anticipated by Li et al., U.S. Patent No. 6,529,508, issued on March 4, 2003, hereinafter Li. Claims 1-39 have been canceled, however, due to the similar scope of new claims 40 *et seq.* to the prior claims, Applicant wishes to address the rejection accordingly.

The present invention, as set forth in representative new claim 40, comprises in part:

40. A method for use with classifying packets, comprising:

creating a plurality of logical segments, each of the logical segments corresponding to a portion of a packet header;

iterating values in each of the plurality of logical segments from zero to a maximum value;

creating a bitmap for each of the iterated values, each bitmap having one or more bits, each bit corresponding to a rule, each bit indicating whether a rule applies to the iterated value; and

grouping, to create an equivalency set for each of the plurality of logical segments, ranges of iterated values having equivalent bitmaps into one or more index sets, each index set having an index number.

Li discloses a method for packet classification with multiple answer sets. Li separates packet headers into segments, and creates an answer set (bitmap) for each segment. Each bitmap of Li corresponds to a set of rules that apply to the particular segment. Li then takes these multiple bitmaps and performs a single AND operation to determine which rules apply to the packet.

Applicant respectfully urges that Li does not show Applicant's claimed novel ***"grouping, to create an equivalency set for each of the plurality of logical segments, ranges of iterated values having equivalent bitmaps into one or more index sets, each index set having an index number."***

Applicant claims a system for high speed packet classification that groups bitmaps, such as the answer sets in Li, into equivalency sets for each segment of the packet header. These equivalency sets have index sets that group ranges of iterated values with the same applicable rules. Once these groups are established, each index set is assigned an index number. Li does not address grouping the bitmaps into equivalency sets. Li merely teaches either calculating each bitmap for each segment as the packet header is received, or looking up the corresponding bitmap for each possible value of the segment in a lookup table.

Applicant respectfully urges that Li is legally precluded from anticipating the claimed invention under 35 U.S.C. §102 because of the absence from Li of Applicant's claimed ***"grouping, to create an equivalency set for each of the plurality of logical seg-***

ments, ranges of iterated values having equivalent bitmaps into one or more index sets, each index set having an index number.”

Applicant also wishes to address another embodiment of the present invention, as set forth in representative new claim 49, which comprises in part:

49. A method for classifying a packet using rules, comprising:
- receiving a packet having a packet header;
 - dividing the packet header into a plurality of logical segments, each logical segment having a value; and
 - determining which rules apply to the packet by,
 - i) looking up a predetermined range to which the value of each of the logical segments belongs, the range corresponding to a predetermined index set,
 - ii) looking up predetermined cross-producted relationships based on the predetermined index sets to reach a final cross-producted relationship, and*
 - iii) looking up a final bitmap corresponding to the final cross-producted relationship, the final bitmap having one or more bits, each bit corresponding to a rule, each bit indicating whether a rule applies to the packet.*

Li discloses a method for packet classification with multiple answer sets, as described above.

Applicant respectfully urges that Li also does not show Applicant's claimed novel steps of *“looking up predetermined cross-producted relationships ... to reach a final cross-producted relationship, and looking up a final bitmap corresponding to the final cross-producted relationship, the final bitmap ... indicating whether a rule applies to the packet.”*

Applicant further claims a system for looking up all the cross-producted relationships of the index sets to determine which rules apply to a packet. Once established, these lookup tables are used by Applicant without the need to recompute or recalculate the cross products of any bitmaps to determine the applicable rules. In this way, when a packet is received, Applicant simply applies a series of lookup tables to classify the packet. Li does not address using lookup tables for determining which rules apply to a packet. Li teaches performing an AND operation on the first level bitmaps for each packet that is received, which is not scaleable and could be difficult to process if there are many rules (possibly many thousands).

Applicant respectfully urges that Li is legally precluded from anticipating the claimed invention under 35 U.S.C. §102 because of the absence from Li of Applicant's claimed *"looking up predetermined cross-producted relationships ... to reach a final cross-producted relationship, and looking up a final bitmap corresponding to the final cross-producted relationship, the final bitmap ... indicating whether a rule applies to the packet."*

Further, at paragraph 10 of the Office Action, prior claims were rejected under 35 U.S.C. §103(a) as being unpatentable over Li in view of Gupta et al., "Packet Classification on Multiple Fields," hereinafter Gupta. Applicant's believes that Gupta was first published by Stanford University on or about August 31, 1999 for an ACM SIGCOMM conference in Cambridge, MA.

Applicant respectfully urges that the date of invention for Applicant's claimed invention is prior to the effective date of Gupta. A declaration of prior invention under 37 C.F.R. §1.131 has been filed herewith by the inventor of the present invention to attest to the prior invention. Attached with the declaration as evidence of Applicant's prior in-

vention is the company confidential design specification, "TurboACL Software Unit Design Specification." This document was written by the inventor for the present invention on or before November 18, 1998, as shown by the latest revision date, which is clearly prior to Gupta's publication date, August 31, 1999. Applicant also wishes to draw Examiner's attention to section 10 of Gupta, "Acknowledgements," which states: "We also wish to thank Andrew McRae at Cisco Systems for independently suggesting the use of bitmaps in storing the colliding rule set, and for useful feedback about the RFC algorithm."

Accordingly, Applicant respectfully urges that because Gupta was published after Applicant's date of invention, Gupta must be withdrawn from consideration as prior art against the present invention.

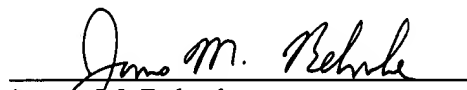
All independent claims are believed to be in condition for allowance.

All dependent claims are believed to be dependent from allowable independent claims, and therefore in condition for allowance.

Favorable action is respectfully solicited.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,


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Annotated Sheet

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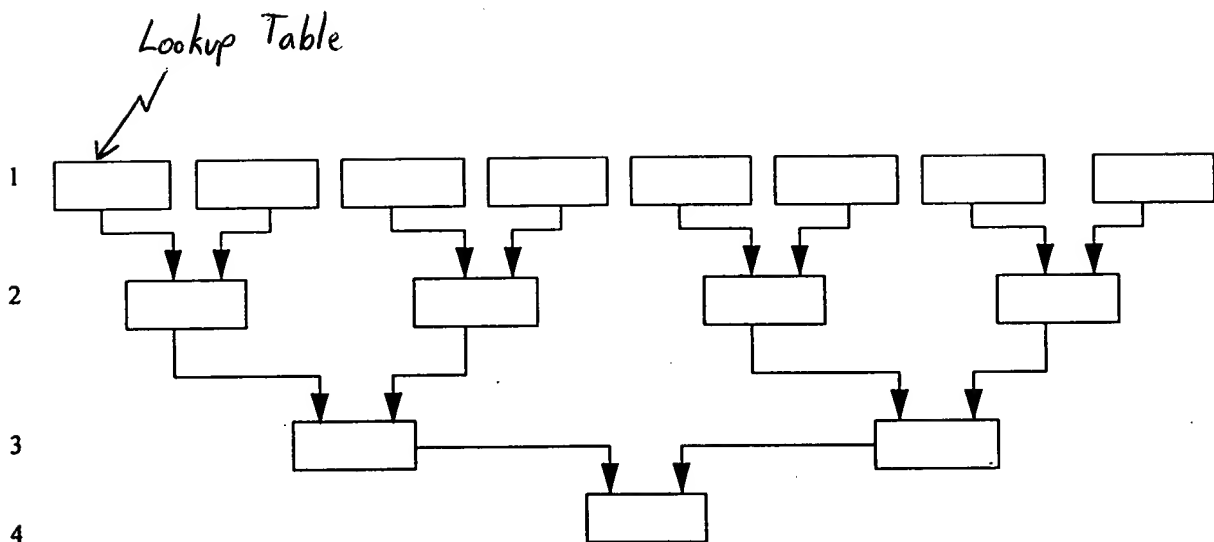


Fig. 12